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Commission des Thons de l'Océan Indien

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Industrial Tuna Purse-Seine : Background and Vessels

IOTC ROS SFO TR12.1 & 12.2

Category: IOTC fishery: Tuna Purse-Seine Fishery

[IOTC ROS SFO TR12]



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This module aims to familiarize Observers with tuna purse-seine vessels, fishing gear and fishing operations as these will be used daily in their routine work.

It is important for observer to be familiar with the following:

- ✓ vessels and fisheries background
- ✓ the basic layout of tuna purse-seiners
- ✓ tuna purse-seine fishing gear
- ✓ tuna purse-seine fishing operations



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INDUSTRIAL TUNA PURSE SEINE

1. Active fishing technique
2. Targets surface pelagic fish (down to 300 m)



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- ✓ Industrial tuna purse-seining is an active fishing technique that uses the active movement of the fishing gear to target tuna and tuna-like fishes above the thermocline, in the surface and sub-surface zone.
- ✓ This fishing technique, enables fishers to catch and freeze large quantities of tuna, being used by industrial and semi-industrial fleets throughout the Atlantic, Pacific and Indian Oceans.
- ✓ Tuna purse seine vessels commonly target fish at depths of 60–70 m, sometimes reaching up to 300 m depth, although setting below 150 m is rare.
- ✓ Tuna purse seine vessels fishing grounds range from the high seas to areas near the coast.



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INDUSTRIAL TUNA PURSE SEINE VESSELS

- Highly mobile and change fishing areas rapidly to follow fish
- Average catch of 20 to 30 tonnes per fishing set
- 60 to 120 meters
- Operate on high seas
- Up to 2 months at sea



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- ✓ The industrial fleets of super seiners which can be up to 110 m long, are highly mobile and can change oceans regions rapidly in response to fishing conditions and market demands.
- ✓ These vessels can catch large volumes of fish, in average 20 to 30 tonnes per fishing set, that they freeze in refrigerated brine (water and salt solution) and store in fish wells at -20°C.
- ✓ A tuna purse-seiner can catch and freeze up to 800 / 1200 Mt of fish before returning to port to unload or tranship its catch.
- ✓ The size of the vessel can vary, however, the basic operations are the same on all tuna purse-seine vessels.



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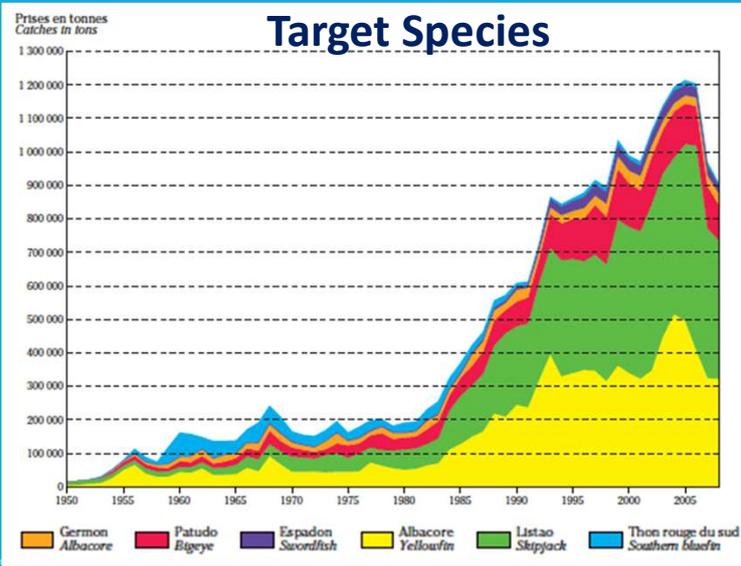


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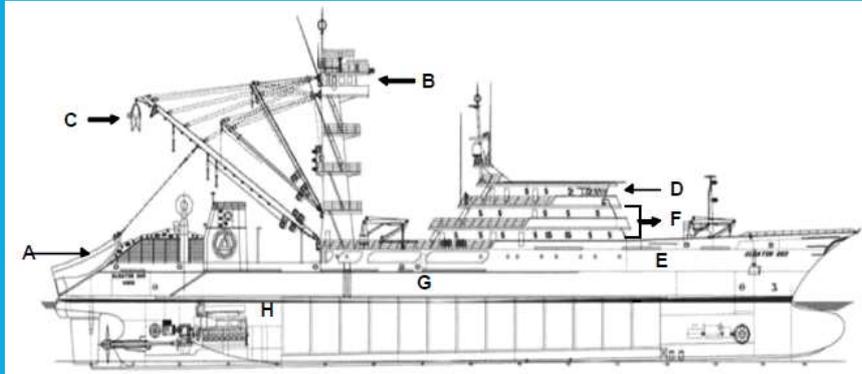
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- ✓ Tuna purse-seiners target species include adult and juvenile Yellowfin and Bigeye tuna, Skipjack tuna and small tuna-like fish such as Frigate tuna and Kawakawa in tropical waters.
- ✓ Purse-seine fisheries bycatch can include a range of oceanic species such as marlins, pelagic sharks, other pelagic fish and PET species such as turtles, whale sharks and even whales or dolphins (more common in the Atlantic and Pacific Oceans).
- ✓ Tuna purse-seine catch evolution in the Indian Ocean from 1950 to 2008, shows that the main species targeted are:
 - Skipjack (46%)
 - Yellowfin tuna (35%)

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TUNA PURSE SEINER BASIC LAYOUT



- | | |
|-----------------------------|---------------------------------|
| A. Back of main deck | E. Upper deck (crew) |
| B. Crow's nest | F. Upper deck (officers) |
| C. Power block | G. Main deck |
| D. Bridge | H. Lower deck |



Layout of large oceanic Tuna Purse-seiners are all very similar.

- ✓ On the upper bridge also called summer bridge (I) we'll find all antennas (radio, radar, satellite, GPS, Goni), and the mast supporting the navigation lights
- ✓ At the upper decks we'll find: the bridge (D), the kitchen, cabins and crew space (E), the cabins and the officers' quarters, as well as the infirmary (F) and the console for controlling the operation of the winches.
- ✓ At the main deck (G) we'll find: the back deck (A) used to store the seine and the skiff; the main mast which ends with a crow's nest (B), a lookout for tuna; and the power-block (C), fixed on a long horn, used to raise the seine.
- ✓ At the level of the lower deck (H) we'll find: the engine room and the navigation bar on the back and the fish holds and the well to the chains of the mooring anchors, in the centre and on the front.





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- ✓ The bridge and accommodation are placed forward of the workspace
- ✓ At the centre of the deck, a crows nest is placed at the top of the mast. A very heavy boom is fitted at the mast to carry the hydraulic power block.
- ✓ A three-drum purse winch returns the main seine line by the stern after the fish are inside the net and a hydraulic power block to haul back the net on the port side. Fish are also brailed from the net on the port side.
- ✓ The power block is also used to stack the net on the stern of the vessel, with the float line stacked on the starboard side and the chain weights on the port side.
- ✓ Vessels are equipped with a skiff located on top of the net or at the stern ramp of the vessel.



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Bridge

- Command, navigation and communication station with a large number of instruments

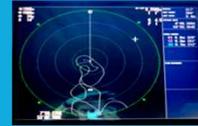


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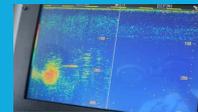
Radar Bird Radar



Sonar



Sondeur



FAD software



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Crow's bow

- High observation station
- Watchers spend their days scanning the horizon with powerful binoculars looking any signs of fish

Power-block

- Hauls back the net
- Stacks the net at the end of fishing set.



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Operation control console

- Controls the seine, the power-block, and the horns (beams)
- Overlooking the main deck



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PURSE WINCH

Photo SPC

Three-drum Purse Winch

- ✓ returns the main seine line by the stern of the vessel.



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Net Skiff



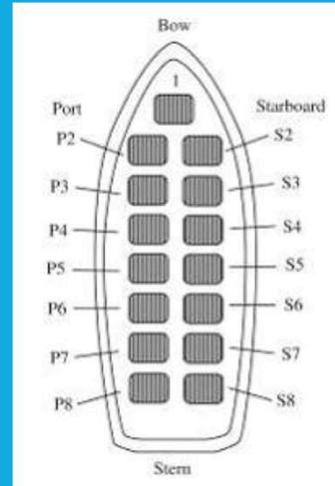
- anchors one end of the net while the vessel circles the school.



TUNA PURSE SEINER BASIC LAYOUT

Lower deck or well deck

- Where the fish is sorted, frozen and stored.



- ✓ Below the upper deck is the well deck that runs down the full length of the vessel.
- ✓ The brine storage wells are situated on either side of the deck.
- ✓ On most vessels a conveyor belt runs down the centre of the deck and leads fish from the chute where the brail is emptied to designated wells for brine freezing (at -20°C), each with a capacity of 20 to 40 metric tonnes (total 800 to 2000 metric tonnes).
- ✓ Some vessels also possess dry storage that allows to preserve fish at -40°C .



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THE CREW ON A PURSE-SEINER

25 to 35 people of various nationalities

- The bridge team

- Bridge officers mainly of the same nationality of the flag of the ship: Captain, fishing master, 1st officer, 2nd officer
- Bosun, 2nd bosun same nationality of the flag of the ship or other
- Sailors : Malagasy, Senegalese, Ivorian, Ghanaians, Seychellois, Indonesians, Filipinos and sometimes the nationality of the flag

- The engine team

- Engine officers of the nationality of the flag: Chief engineer, 2nd engineer, Factory Manager
- Greasers of various nationalities



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THANK YOU FOR YOUR PARTICIPATION



ANY QUESTIONS?

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